Carestream Molecular Imaging Software Overview

The Carestream MI Software package is more comprehensive and user friendly than ever before. Application specific tool palettes provide access to specific tool sets for manipulation and analysis of images of gels, blots, arrays, plate assays, small animals and more.
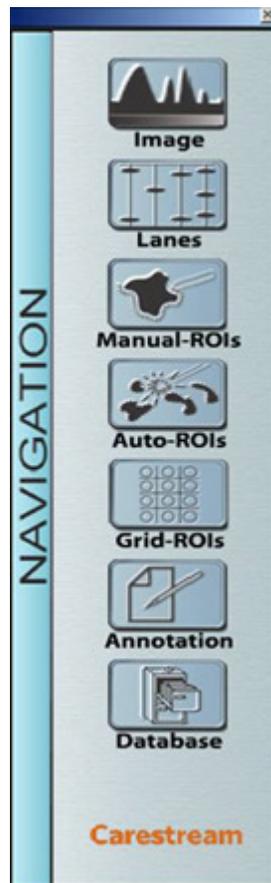

Image – tools for control of image appearance, including rotation, cropping and flipping; histogram display and control; software filters and pseudocolors; Image math

Lanes – tools for lane and band analysis, including auto-lane and auto band finding, standards, intensity profile, mass curves

Manual-ROIs – tools for drawing regions of interest and generation of intensity, geometric and positional data

Auto-ROIs – tools for automatic identification of interest and generation of intensity, geometric and positional data

Grid-ROIs – tools for defining and analyzing ROIs in a grid format such as a microplate, slot blot, or array

Annotation – tools for labeling an image with text, graphics, data and other features to enhance communication of results

Database – tools for setting search criteria to find projects based on key words or other file information

Image Panel

The Image Panel provides tools to control the appearance of images on screen and in print.

The **Image Display** window provides access to the image histogram, and complete control over histogram and image appearance, including brightness/contrast/gamma, image min/max, pseudocolor, software filters, image overlays, etc.

Free **Rotate and Flip** functions allow proper image orientation

Signal Orientation defines features of interest as white or black for analysis algorithms

Image Math allow mathematical calculations to be performed on one or a pair of images. Options include Tasks, Formulas, or Image Processing

Image Correction applies a lens or illumination correction to an Image Station 1000, 2000, or 4000 series image

Info/History opens a window that stores project information such as capture conditions, key words, and "destructive" changes to an image (i.e. cropping)
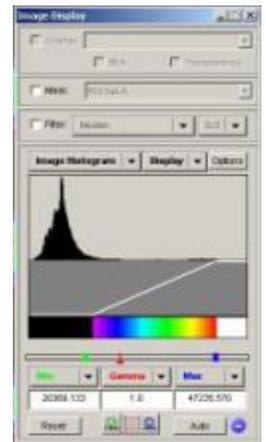
click image to enlarge

Lanes Panel

The Lanes Panel provides tools for the analysis of lanes and bands in electrophoresis gels or blots.

Auto-lane finding and **Auto-band finding** makes analysis of electrophoresis gels fast and easy

An **Intensity Profile** is generated for each lane, and mobility and intensity date is generated for bands within each lane.

If an appropriate **Standard** is defined, mass and molecular weight values of unknown bands may be calculated as well.

Analysis data, including mobility, molecular weight, mass, intensity, band area, background and gaussian model can be selectively displayed in spreadsheet format

Multiple lane sets may be defined, allowing rapid analysis of high capacity gel formats
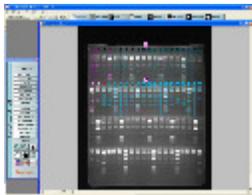
(top)

Manual ROIs Panel

The Manual ROIs panel allows for manual definition and subsequent measurement for one or more regions of interest (ROIs) on an image.

A variety of **Tools** are provided to manually draw ROIs, including multiple ROI sets on one image.

Two or more ROIs can be set as **Standards**, from which **Mass Curves** are generated and used to produce mass data for other ROIs within a set.

Multiple user selectable **Background** definitions are available for improved accuracy of intensity data.

ROI Templates can be created allowing the same ROI definitions and standards to be used across a series of images.

Once defined, MI software produces intensity, geometry, and positional data for each ROI. In addition, a set of ROIs can be counted or compared quickly and easily. Quantitative data can be selectively displayed in spreadsheet format or exported for further analysis.
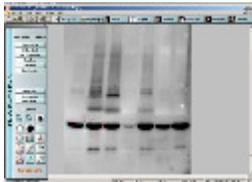
Click image to enlarge

(top)

Auto-ROIs Panel

The Auto-ROIs panel provides four different methods of automatic region of interest (ROI) definition and subsequent analysis defined ROIs on an image.

Edge Detection identifies features by searching for gradient edges.
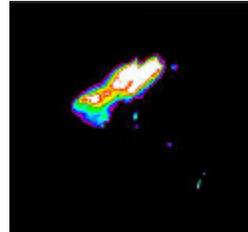
Threshold uses a user defined signal threshold value to identify features from the background.

Density Slice segregates the image into three discrete density ranges, and identifies features that are in the middle density range.

The Peak Finder creates oval or rectangular ROIs around peaks of intensity, and is particularly useful for identification and counting of overlapping ROIs (such as bacterial colonies).
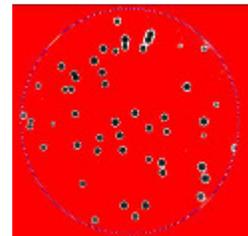
Once defined, MI software produces intensity, geometry, and positional data for each ROI. In addition, a set of ROIs can be counted or compared quickly and easily. Quantitative data can be selectively displayed in spreadsheet format or exported for further analysis.

Grid-ROIs Panel

The Grid-ROIs panel allows definition of a grid for analysis of slot blots, microplates, arrays or other assays that have ROIs in regularly spaced columns or rows.

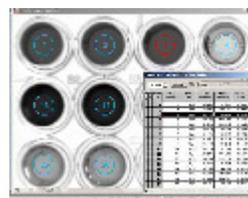Once defined, **analysis data**, including intensity, background, geometry, positional values for each ROI can be selectively displayed. Multiple ROIs can be set as **mass standard**s, from which a **mass curve** is generated and mass values for experimental ROIs are derived.
ROI templates can be created and saved to streamline analysis of a series of similar images
ROI data can be exported as a tab-delimited text file for further analysis and manipulation in other software packages

Annotations Panel

The Annotations panel provides a copy of the image on an annotations palette and provides tools for adding figure legends, call outs, labels and other text and graphics to prepare the image for communication or publication.
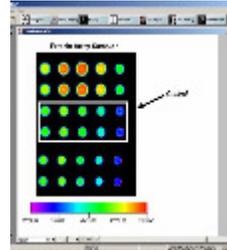
A variety of elements from an image project can be added to the annotations palette, including:

Image, which can be cropped and zoomed in to show specific features of interest
Analysis Data which can be dragged & dropped or copied from the analysis window
Intensity Profile if an image has been analyzed using the Lanes set of tools
Mass Curve if mass standards have been assigned
Intensity Scale which provides a visual index of intensities as defined in the Image Display window

(top)

Database Panel
Carestream MI software includes an **Image Database** feature that uses data stored in a project's File Information to employ an advanced search strategy to locate and open a specific project file.

In addition, a **Gel Comparison** feature compares the presence or absence of bands across multiple images stored in the database, and displays the results of this analysis in sorted order.
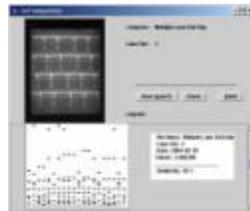
A **Differential Display** feature uses one lane as a reference and compares this lane to all other lanes in the same image. Lanes are compared on a band by band basis to determine if net intensities or mass are increasing or decreasing.